POINT 4 COMPUTER
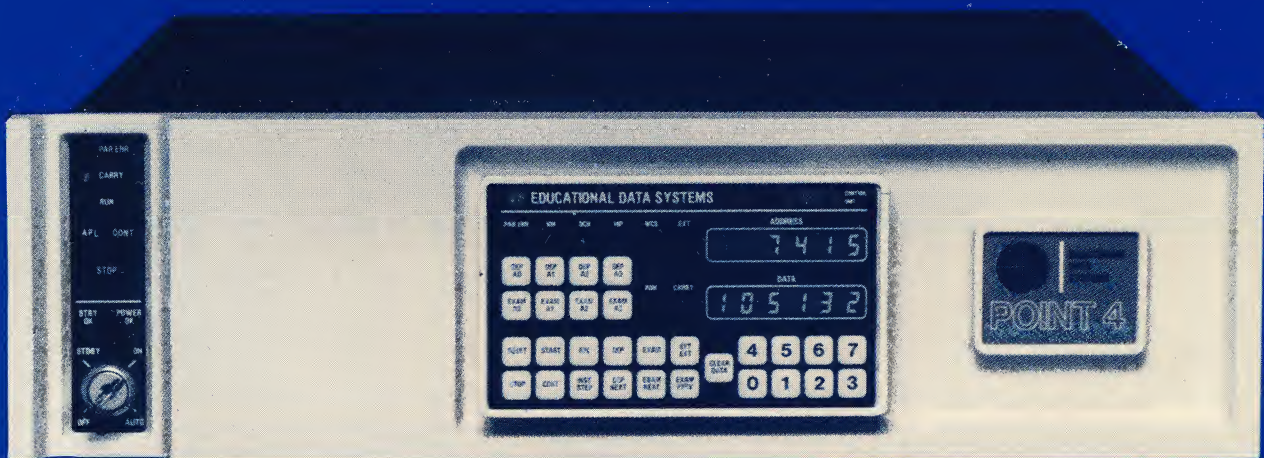
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Introducing the POINT 4:

The Company

Educational Data Systems Inc. began operation in 1969 by developing software tools for the emerging minicomputer industry. The company and its product line have grown steadily, and today we offer operating systems, languages, a data base management system, application software, data communication equipment and high-speed microprogrammable processors for use with NOVA[1]-type minicomputers and LSI-11[2] microcomputers. Now EDSI offers its own high performance computer, the POINT 4.

These products and a wide range of services are provided to system houses, OEM's, computer and peripheral equipment manufacturers and government agencies.

AT EDSI, the emphasis is on developing and building sound, fundamental system tools with which our customers configure proprietary systems that excel in the highly competitive field of multi-terminal, small computer systems.

1. "NOVA" is a registered trademark of Data General Corp.
2. "LSI-11" is a registered trademark of Digital Equipment Corp.

The Business Concept

EDSI views the minicomputer field from a different perspective than do most other mini manufacturers, who, almost invariably, have built the computer first and then struggled over a period of years to develop compatible software. We started by developing software for existing computers, and this extensive experience disclosed many ways in which the hardware could be improved. We designed the POINT 4 and related products to realize these improvements, to enhance the performance of our extensive software base, and to provide an advanced architecture for future software developments in data management, data communication and distributed processing applications.

A Competetive Edge . . .

A second characteristic distinguishes EDSI. Our products, services and policies are designed with a single aim: to give our system house customers a competitive edge.

The POINT 4 comes to market fully equipped with field-tested system and application software. We designed the POINT 4 to optimize the performance of that software. We have the people and experience to support it professionally and to train our customers in its use.

We license the software unbundled, support the top peripherals from many manufacturers, and offer both software and hardware at high discounts, over long contract periods. And, when an End-User wants a system based on our products, we refer him to one of our system house customers.

All hardware and software carry a full one year warranty. And, we support our customers through software subscription services and periodic training seminars.

The Architecture

We introduced the POINT 4 to improve the performance and profitability of systems based on EDSI products. To achieve this goal, we needed a design that would be fully compatible with our IRIS software, Mighty Mux DMA channel multiplexer, and all the NOVA-type peripheral controllers that IRIS supports.

In addition, we set out to double throughput, double the amount of directly addressable RAM, provide a flexible means of extending the instruction set, provide a high speed channel for computer-to-computer communication, simplify operation and maintenance, and reduce the number of subassemblies and parts required.

Innovative Design

We achieved these goals through the use of a novel design technique, Programmable Sequential Control Logic. The POINT 4 operates at almost twice the speed of a Nova 3 and directly addresses 128K bytes of onboard RAM. Microprogramming techniques and a Programmable Control Store permit the emulation of various instruction sets, and a High Speed Inter-Processor bus operates at 4 megabytes per second. A virtual control panel and built-in diagnostics make the POINT 4 probably the easiest computer on the market to operate and to maintain. Yet, the computer, memory, and all options are implemented on a single printed circuit board.

Educational Data Systems

Features that work for you

Features:

- ☐ Instruction execution, including access, in .4 microseconds
- ☐ Up to 128K bytes of directly addressable RAM
- ☐ CPU and RAM on one board
- ☐ Mighty Mux DMA multiplexing
- ☐ Compatible with Nova-type peripheral controllers
- ☐ Compatible with IRIS and other Nova-type software
- ☐ Extended Instruction Set via Programmable Control Store
- ☐ High Speed Inter-Processor bus
- ☐ Virtual Control Panel (via CRT)
- ☐ Remote or Attached Operator Control Unit (Optional)
- ☐ Built-in CPU/Memory diagnostics
- ☐ Memory parity error detection
- ☐ Battery Back-up
- ☐ "Jumper Saver" logic
- ☐ Front loading chassis, no slides required
- ☐ Separate power supply chassis

PERIPHERALS

The POINT 4 is compatible with a wide range of peripherals including:

- ☐ EDSI's Mighty Mux DMA Channel multiplexer, which provides real time clock and interfaces for master terminal, CRT's, character and line printers, asynchronous and synchronous (SDLC) communication links, etc.
- ☐ EDSI's Micro-N, high speed microprogrammable processor.
- ☐ Virtually all Nova-type peripheral controllers.

System Software

IRIS Interactive Real-time Information System. A multi-tasking, time sharing operating system. On the POINT 4, IRIS supports up to 32 terminals in simultaneous use for data entry and retrieval, program preparation, debugging, and execution. IRIS concurrently supports:

Business BASIC – A high level business oriented language that features interactive
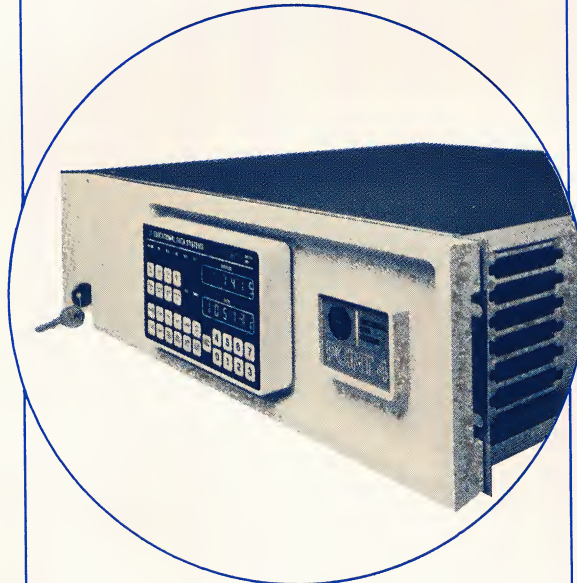
programming, extended precision, floating point, decimal arithmetic, string processing, CRT mnemonics, and four powerful data file structures: Text Files, Formatted Files, Contiguous Files, Indexed Random Files.

Assemblers – Absolute Assembler, Extended, Relocating, Macro-Assembler

Text File Editor – Edits assembly source, BASIC programs, English text, etc.

BSC – Bi-sync support software for Data Communications (2780/3780 emulator)

Utilities

Utilities – A wide range of utilities for the management, control, accounting, and security control of data processing operations.

Infotrieve – Data Base Management System Query Language. It permits on-line searching and manipulation of multi-file data bases. No programming is required.

Informat – A report generator that uses the search capabilities of Infotrieve.

Applications Software

The following application Software is written in Business BASIC:

MACS – Management, Accounting, Control System. An on-line system for distributors, retailers, and manufacturers. MACS includes:

- ☐ GLAS – General Ledger Accounting Subsystem
- ☐ ORIS – Order Entry, Receivables, Inventory Subsystem
- ☐ PIPS – Purchases, Inventory, Payables Subsystem
- ☐ PAYS– Payroll, Personnel Subsystem

STYLUS – Word Processing System. All the features of conventional word processing.

- ☐ Left and right justification
- ☐ Proportional spacing
- ☐ Automatic centering
- ☐ Tabbing and decimal tabbing
- ☐ Auto-underlining
- ☐ Automatic letter addressing

Plus, the power of IRIS file structures that enables the storage, indexing, retrieval and manipulation of text and data.

READINET – Project Control System - for management of projects such as construction jobs, using PERT/CPM techniques.

HIPS – Hospitality Industry Processing System - A complete front desk and back office accounting system for hotels, clubs, and restaurants.

Maintainability and Reliability

- MINI CONTROL PANEL – This panel contains a lockable power switch; APL, CONTINUE and STOP control switches; and indicator lamps for RUN, CARRY, PARITY and BATTERY MONITOR. All other control and monitoring functions are normally performed through the Virtual Control Panel.

- VIRTUAL CONTROL PANEL – Software loaded automatically when the APL (Automatic Program Load) switch is depressed permits all monitoring and control functions to be performed in octal from a master CRT terminal. This eliminates the need for the optional Operator Control Unit in many applications.

- BUILT-IN DIAGNOSTICS – By pressing a button, an operator can load diagnostic programs from an on-board PROM which test all CPU functions and test every cell of memory with a worst-case memory pattern.

- JUMPER SAVER LOGIC – Logic on the backplane eliminates the need to jumper data channel and interrupt priority signals around unoccupied board slots.

- PARITY ERROR – Optional parity error logic detects errors in the main memory, halts the machine and indicates the error via the mini panel.

- BATTERY BACKUP – Optional main memory backup maintains the contents of memory for at least four hours in the event of power failure. The memory refresh also continues to operate whenever the CPU power switch is in the standby position, permitting the computer to be turned off for arbitrarily long periods without loss of memory. A Power Monitor Auto-Restart circuit causes the CPU to be halted in the event of AC power loss and later automatically restarted without loss of information.

- WARRANTY – the POINT 4 carries a full one-year factory warranty which may be extended from year to year.

Operator Control Unit

This optional unit can be attached to the front panel or operated remotely at the end of a ribbon cable. The unit contains all the displays and switches necessary to monitor and control the processor. Included are two octal displays for address and data and eight indicators for monitoring various processor activities. Sealed membrane octal switches permit loading and examination of memory and accumulators. Other membrane switches control automatic program load and program execution.

Programmable Control Store

A PCS with 100 nanosecond cycle time can be used to extend the instruction set to emulate other machines or to perform complex operations such as decimal arithmetic, string processing and stack operations at high speeds. Such extensions of the standard instruction set will be used to increase the speed of IRIS and applications software.

High Speed Inter-Processor (HIP) Bus

In addition to the standard DMA Bus, an Inter-Processor Bus is available which permits communication between two CPU's or between the CPU and a very high speed peripheral device at speeds up to four megabytes per second. This Bus and handshaking for the communication are implemented on the CPU board.

Purpose Mini-Computer

Packaging

The POINT 4 package consists of four subassemblies:

1. The main chassis – a 7-slot front loader. Boards are spaced on .6" centers with 1.0" at the bottom for routing of ribbon cables to the rear.

2. The fan module – It contains two whisper-quiet fans and the mini-control panel with lockable power switch, APL, CONTINUE and STOP switches; and RUN, CARRY, PARITY and BATTERY indicators.

3. The power supply chassis – A separate power supply chassis, cabled to the main chassis, contains a switching type supply providing 35 amps at +5v and additional supplies for +12v, −5v and ±15v. The optional batteries (3 lead-acid 6v batteries in series) and battery monitoring and recharge circuits are also packaged in this unit. The power supply chassis can be mounted directly above the main chassis or at any other location within 5 feet of it.

4. The Front Panel – A sculptured blank panel that snaps off to provide access to the boards. The optional Operator Control Unit can be mounted on the Front Panel, making connection with the CPU board through a small slot in the front panel, or it can be operated remotely, connected by a ribbon cable that enters the main chassis through a slot at the bottom of the Front Panel.

Instruction Set

The POINT 4 computer provides a 16-bit multi-function instruction set which is compatible with many industry-standard operating systems in addition to the EDSI IRIS system. The instruction set includes memory reference, arithmetic/logical, and input/output instructions. Memory reference instructions move data between memory and accumulators and modify the program flow using direct, relative, indexed, and/or indirect addressing.

They include: load accumulator, store accumulator, jump, jump subroutine, increment and skip if zero, and decrement and skip if zero.

Arithmetic and logical instructions execute one of eight basic functions, modify the operand, shift the result, and test the result in only one cycle. The eignt functions are: add, subtract, move, increment, negate, complement, add complement, and logical-AND.

The input/output instructions transfer data and control between the processor and peripherals via 16 bidirectional data lines. Three control strobes each are used, and there are instructions to skip if a device is "DONE" or "BUSY".

Configurations

The POINT 4 computer is available in four configurations:

a. POINT 4/1 – CPU/memory board with 64K bytes RAM

b. POINT 4/2 – CPU/memory board with 128K bytes RAM

c. POINT 4/3 – CPU/memory board with 64K bytes RAM, front panel, chassis, and power supply

d. POINT 4/4 – CPU/memory board with 128K bytes RAM, front panel, chassis, and power supply.

All POINT 4 configurations include the Virtual Control Panel.

Speed

Memory Cycle Time	400nsec.
PCS Cycle Time	100nsec.
Clock Rate	30MHz
Standard Date Channel	
Input	1000nsec.
Output	1600nsec.
High Speed Data Channel	
Input	800nsec.
Output	1200nsec.
HIP Bus Transfer Rate	4 Mbytes/sec.
Interrupt Response	1200nsec.
Instruction Execution Times	
Arithmetic & Logical Instructions	400nsec.
Memory Reference Instructions	800nsec.
Input/Output Instructions	700-1200nsec.
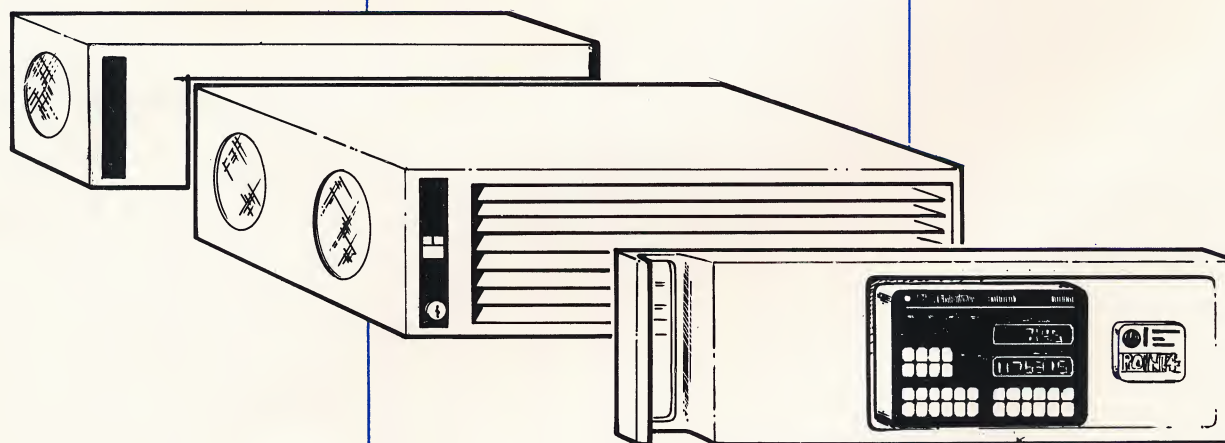
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